SUBSTITUTE FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER
12758-020001

U.S. APPLICATION NO. (If Known, see 37 CFR 1.5) 09/786604

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE99/02804	3 September 1999	4 September 1998

TITLE OF INVENTION
METHOD FOR OPERATING A RADIO COMMUNICATION SYSTEM AND CORRESPONDING RADIO COMMUNICATION SYSTEM

APPLICANT(S) FOR DO/EO/US
Gerhard Ritter

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern other documents or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
    ☒ Annexes to the International Preliminary Examination Report
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March 5, 2001 Samantha Bell Samantha Bell

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U.S. APPLICATION NO. (IF KNOWN) 09/786604	INTERNATIONAL APPLICATION NO. PCT/DE99/02804	ATTORNEY'S DOCKET NUMBER 12758-020001

17. ☒ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)- (5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1000**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$860**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... **$710**

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)..... **$690**

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)..... **$100**

	CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0.00	

Claims	Number Filed	Number Extra	Rate		
Total Claims	14 - 20 =		x **$18**	$0.00	
Independent Claims	4 - 3 =		x **$80**	$80.00	
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)			+ **$270**	$270.00	
TOTAL OF ABOVE CALCULATIONS =				$0.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				$0.00	
SUBTOTAL =				$0.00	
Processing fee of **$130** for furnishing the English Translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f))				$0.00	
TOTAL NATIONAL FEE =				$0.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$0.00	
TOTAL FEES ENCLOSED =				$1,210.00	
				Amount to be refunded:	$
				Charged:	$

a. ☒ A check in the amount of $1,210.00 to cover the above fees is enclosed.
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NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.

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FIG 1

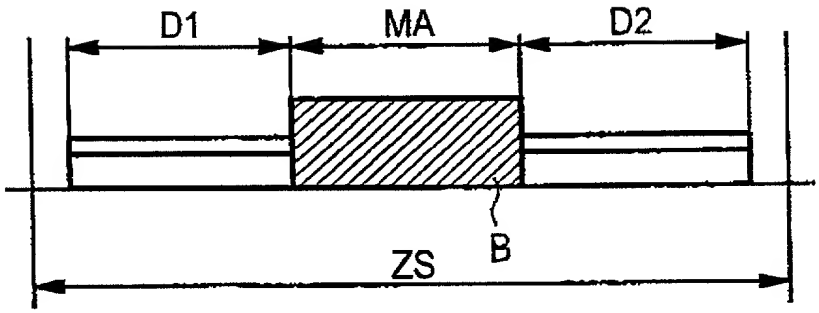

FIG 2

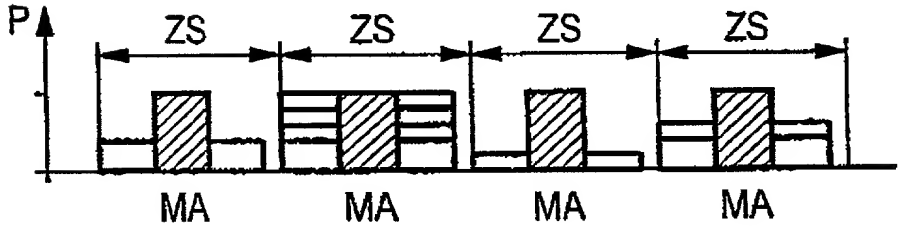

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FIG 3

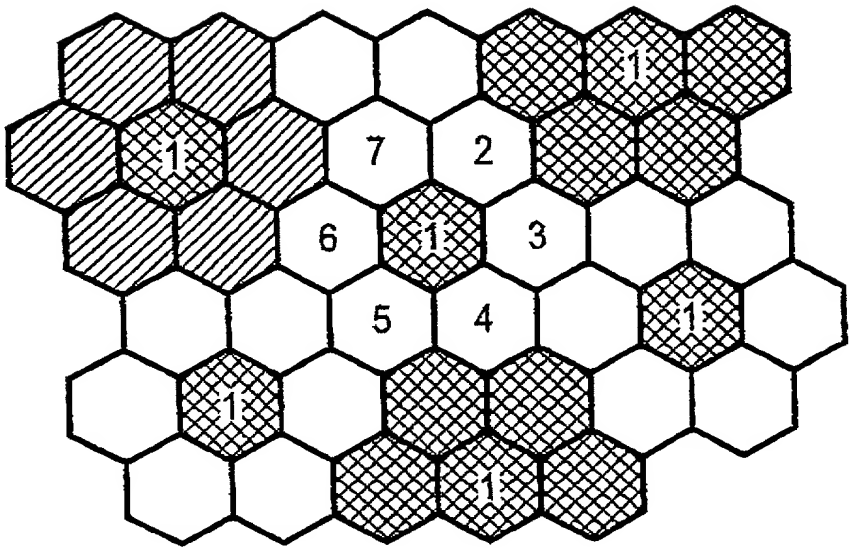
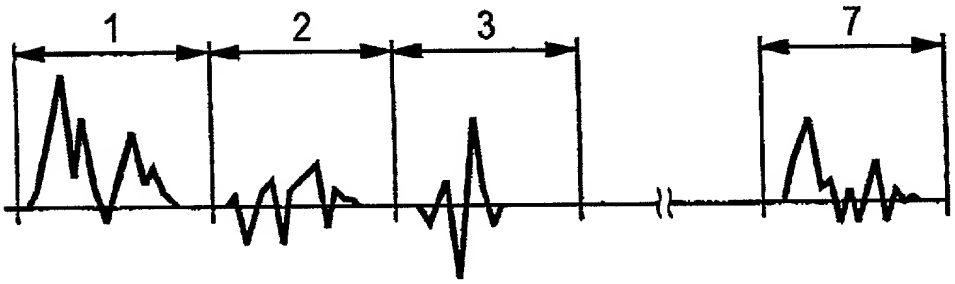


FIG 4



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Gerhard Ritter
Serial No. : 09/786,604
Filed : March 5, 2001
Title : METHOD FOR OPERATING A RADIO COMMUNICATION SYSTEM AND CORRESPONDING RADIO COMMUNICATION SYSTEM

Art Unit : Unknown
Examiner : Unknown

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U.S. Patent and Trademark Office
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Arlington, VA 22202

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as follows:

In the claims:

Amend claims 1-14 as follows:

-- 1. (Amended) A method of measuring transmission characteristics of radio channels in a radio communications system having a number of base stations and a radio station, the radio communications system utilizing a timeslot structure in a time frame for transmitting data, the method comprising:

transmitting data as bursts from one of the base stations to the radio station, each burst having a channel measurement sequence, the one of the base stations transmitting the channel measurement sequence in at least one timeslot in which no data is transmitted from the one of the base stations to a radio station.

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2. (Amended) The method as claimed in claim 1, wherein the channel measurement sequence is transmitted using at least one of (i) a constant power level and (ii) a number of base stations at the same time.

3. (Amended) The method of claim 1, wherein the channel measurement sequence is transmitted in the middle of a burst.

4. (Amended) The method of claim 1, wherein the base stations are synchronized.

5. (Amended) The method as claimed in claim 4, wherein cyclic correlation is used for channel measurement.

6. (Amended) The method as claimed in claim 5, wherein individual base stations use a same channel measurement sequence.

7. (Amended) The method as claimed in claim 6, wherein the channel measurement sequence is transmitted with a different code phase by different base stations.

8. (Amended) The method of claim 1, wherein a channel measurement sequence in a predetermined timeslot in the time frame has a special identifier.

9. (Amended) The method as claimed in claim 8, wherein a same channel measurement sequence is used in the predetermined timeslot as is used in other time slots, wherein phase modulation is used in the channel measurement sequence in the predetermined timeslot.

10. (Amended) The method as claimed in claim 9, wherein 180° phase modulation of the channel measurement sequence is used in the predetermined timeslot from one time frame to a next time frame.

11. (Amended) The method as claimed in one of claims 8, wherein the predetermined timeslot is a 0-th timeslot.

12. (Amended) A radio communications system having a number of base stations and at least one radio station which uses the method of claim 1.

13. (Amended) The radio communications system as claimed in claim 12, wherein the radio communication system is a TDD radio communication system.

14. (Amended) The radio communications system as claimed in claim 12, wherein the radio communication system is a FDD radio communication system. --

REMARKS

Entry hereof and early passage to issue are respectfully requested. Applicant's undersigned attorney can be reached at 617-521-7896.

No fee is believed to be due for this Preliminary Amendment. However, if any fee is due for this or the accompanying Response, please apply it to deposit account no. 06-1050.

Respectfully submitted,

Date: November 29, 2001

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20351854.doc

Version with markings to show changes made

In the claims:

Claims 1-14 has been amended as follows:

1. (Amended) A method of measuring [for measurement of the] transmission characteristics of [the] radio channels in a radio communications system having a number of base stations [(BS)] and a [at least one further] radio station [(MS)], [with] the radio communications system utilizing [having] a timeslot structure in a time frame for transmitting data, the method comprising:

transmitting data as [in which one of the base stations transmits data (D1, D2) in the form of] bursts from one of the base stations to [one of] the [other] radio station [stations], [with] each burst [also] having a [specific] channel measurement sequence [(MA)], the one of the base stations transmitting [characterized in that the base station transmits] the [specific] channel measurement sequence [(MA) even] in at least one timeslot [(ZS)] in which no data is [are] transmitted from the one of the base stations [station] to a [one of the other] radio station [stations].

2. (Amended) The method as claimed in claim 1, wherein [characterized in that] the channel measurement sequence is transmitted [at] using at least one of (i) a constant power level and (ii) [and/or by] a number of base stations [(BS)] at the same time.

3. (Amended) The method of claim 1, wherein [as claimed in one of the preceding claims, characterized in that] the channel measurement sequence is transmitted in the middle of a burst [(B)].

4. (Amended) The method of claim 1, wherein [as claimed in one of the preceding claims, characterized in that] the base stations [(1,...,7)] are synchronized.

5. (Amended) The method as claimed in claim 4, wherein [characterized in that] cyclic correlation is used for channel measurement.

6. (Amended) The method as claimed in claim 5, wherein [characterized in that the] individual base stations [(1,...,7)] use a [the] same channel measurement sequence.

7. (Amended) The method as claimed in claim 6, wherein [characterized in that] the channel measurement sequence is transmitted with a different code phase by [the] different [various] base stations [(1,...,7)].

8. (Amended) The method of claim 1, wherein a [as claimed in one of the preceding claims, characterized in that the] channel measurement sequence in a predetermined timeslot [(ZS)] in the time frame has a special identifier.

9. (Amended) The method as claimed in claim 8, wherein a [characterized in that the] same channel measurement sequence is used in the predetermined timeslot as is used in [as that in the] other time slots [(ZS) is used], wherein [with] phase modulation is [being] used in the channel measurement sequence in the predetermined timeslot [(ZS)].

10. (Amended) The method as claimed in claim 9, wherein [characterized in that] 180° phase modulation of the channel measurement sequence is used in the predetermined timeslot [(ZS) is used] from one time frame to a [the] next time frame.

11. (Amended) The method as claimed in one of claims 8 [-10], wherein [characterized in that] the predetermined timeslot [(ZS)] is a [the] 0-th timeslot.

12. (Amended) A radio communications system having a number of base stations [(BS)] and at least one radio station [(MS) using the method as claimed in one of claims 1 to 11] which uses the method of claim 1.

13. (Amended) The radio communications system [apparatus] as claimed in claim 12, wherein the radio communication system is [with said apparatus being] a TDD radio communication system.

14. (Amended) The radio communications system [apparatus] as claimed in claim 12, wherein the radio communication system is [with said apparatus being] a FDD radio communication system.

Description

Method for operation of a radio communications system, and such a radio communications system.

The invention relates to a method for operation of a radio communications system and such a radio communications system, in particular a mobile radio system with TDD subscriber separation, in which the transmission characteristics of the radio channels are determined.

In radio communications systems, information (for example voice, video or other data) is transmitted by means of electromagnetic waves via a radio interface between a base station and a mobile station. The electromagnetic waves are in this case emitted as carrier frequencies which lie in the frequency band intended for the respective system. Frequencies in the frequency band around approximately 2000 MHz have been provided for future mobile radio systems using TD/CDMA transmission methods via the radio interface, such as the UMTS (Universal Mobile Telecommunications System), or other third-generation systems.

Broadband TD-CDMA, namely a multiple access concept based on a time, frequency and code division multiplexing concept, has been selected as the transmission method for the TDD component of the concept for the third generation of mobile radios, such as the already mentioned UMTS. For UMTS, the TDD transmission method (Time Division Duplex) comprises a TMDA frame having a duration of 10 ms which is subdivided into 16 timeslots having a duration of 625 µs, so that 16 timeslots are available per frame. The timeslots are split into timeslots for the uplink and downlink. The switching point between the uplink and the downlink

can be shifted in the TDD frame in order to support asymmetric traffic. A precise definition of the TDD component of the proposed UMTS system can be found in the proposal "Draft ITU system description for the UTRA TDD component", ETSI SMG2 UMTS-L1, Tdoc SMG2 UMTS-L1 194/98.

Within each time slot with a length of 625 µs, the user signals are additionally separated by means of spread codes. This means that more than one burst of a corresponding length can be transmitted within one timeslot. This number of bursts within the same timeslot may be allocated not only to different users but also partially or entirely to a single user. Different spread codes are used for the large number of bursts within the same timeslot, in order to make it possible to distinguish between the various bursts.

The following problems in a third-generation mobile radio system have not yet been satisfactorily solved,

- carrying out rapid measurement of the base station in use and the adjacent base station,
- rapid handover of a mobile station to another base station,
- elimination of interference signals, and
- position finding by the radio station (mobile station).

The invention is thus based on the object of providing a method and an apparatus which allow rapid and simple measurement of the base station in use and adjacent base stations.

The object is achieved by the features of claims 1 and 12. Preferred embodiments of the invention are the subject matter of the dependent claims.

In the method according to the invention for measurement of the transmission characteristics of the radio channels in a radio communications system having a number of base stations and at least one further radio station, time frames with a timeslot structure are used for transmission in the radio communications system, and bursts are transmitted in each timeslot. In this case, channel measurement sequences are transmitted independently of the data transmission. In contrast to conventional procedures in TDMA (time division multiple access) transmission systems, the primary front is not minimizing interference, but rapid channel measurement with the measures that are dependent on it, such as position finding and handovers.

The base stations which are involved are preferably synchronized to one another. Furthermore, the channel measurement sequence is transmitted continuously at a constant power level. If a number of base stations are transmitting at the same time, then details relating to a number of channels will be available immediately. The channel measurement sequence is preferably transmitted in the middle of a burst, with cyclic correlation being used for channel measurement.

Particular advantages result, irrespective of the continuous transmissions of the channel measurement sequences, if individual base stations use the same channel measurement sequence. If the identical channel measurement sequence used for the individual base stations is transmitted by the various base stations using a different code phase, then this results in the channel measurement results being separate in time in the individual measurement windows of the correlation result. The channel characteristics of the various base stations, and the distances to them, can be determined from the measurements.

Furthermore, the channel measurement sequence in a predetermined timeslot in the time frame may have a special identifier. In this case, the same channel measurement sequence is preferably used as that for the other timeslots, with phase modulation being used for the channel measurement sequence in the predetermined timeslot. 180° phase modulation of the channel measurement sequence in the predetermined timeslot is preferably used from one time frame to the next. This allows a predetermined time slot in the time frame to be identified uniquely, with the 0-th timeslot (the first timeslot in a frame) preferably being identified in this way.

The invention furthermore relates to a radio communications system having a number of base stations (BS) and at least one radio station (MS) which use the method described above.

The method according to the invention can be used for both TDD and FDD systems.

The particular advantages of the invention are that the channel measurement sequences are transmitted continuously at a constant power level, irrespective of the content or the power level of the data sections. The introduction of synchronization of the timeslots and use of measurement sequences based on cyclic correlation results in a reduction in interference from adjacent cells. Single-code or multi-code operation of the radio system is possible.

One preferred embodiment of the invention will be explained in the following text with reference to the drawings.

Figure 1 shows a schematic illustration of a burst in a timeslot with a channel measurement sequence and data sections,

Figure 2 shows various bursts with a constant channel measurement sequence power level,

Figure 3 shows cells of adjacent base stations with typical reuse of the code phases, and

Figure 4 shows the measurement window of a mobile station with seven sections.

The preferred embodiment of the invention explained in the following text is based on a radio system having a timeslot structure and, to assist understanding, on time synchronization of the adjacent base stations. Various methods are known for achieving time synchronization. However, synchronization is not a precondition for the functionality of the method. If the delay times between base stations and mobile stations are short in comparison to the duration of a timeslot, then the timeslots are also synchronized in the mobile stations. Assuming ideal synchronization of the base stations, the only delays which occur are those which result from the differences in the distances between the respective mobile stations and the various base stations. Such delays increase with the distance to the base stations.

Figure 1 shows a schematic illustration of a burst B in a timeslot ZS. Bursts B which last for a shorter period than that of the timeslots ZS themselves are transmitted in each such timeslot ZS. The guard time which results from this is intended to avoid interference resulting from different delay times and synchronization errors. A channel measurement sequence is transmitted during each burst B in order to measure the transmission characteristics of the radio channels. This channel measurement sequence is preferably transmitted in the middle of each

burst (shown black, so-called Midamble MA). A time frame duration of 10 ms is assumed as a numerical example. This time frame is subdivided into 16 timeslots of 625 µs. A burst comprises, for example, two data blocks D1 and D2 each having a duration of 200 µs and a channel measurement sequence, MA (Midamble) with a duration of 200 µs in the middle between the two data blocks D1, D2. This results in a total burst duration of 600 µs, with the remaining 25 µs in each timeslot being used as a guard time. Information can be transmitted in the data blocks D1, D2 to one or more radio stations MS. In this case, in addition to one transmission channel, a number of transmission channels may also be active at the same time, being separated from one another by different codes. One preferred embodiment for different codes is based on a Walsh-Hadamard-Transformation.

If it is further assumed that cyclic correlation is used for channel measurement, then the individual base stations can use the same channel measurement sequence, but with this channel measurement sequence being transmitted with a different code phase by the various base stations. Cyclic correlation in the receivers of the mobile stations MS then results in the channel measurement results from the various base stations being separated in time in the individual measurement windows of the correlation result. Measurement windows of 25 µs each result with the above numerical values when there are, for example, seven different equidistant code phases. As long as the sum of the delay spread, synchronization uncertainty and differences in the distances to the various base stations remains less than 25 µs, there will be no mutual interference between the received channel measurement sequences from the various base stations. Thus, with regard to adjacent base stations, the channel measurement method is orthogonal, even though the measurement sequences are transmitted at the same time and are also received at the same time

in the mobile stations. With the above numerical example, 15 µs, for example, is available for the measurement of the delay spread (signal scattering) and 10 µs for synchronization uncertainties and distance differences, or 5 µs for the measurement of the delay spread and 20 µs for synchronization uncertainties and delay time differences, without any interference occurring in the channel measurement.

As already stated, provided the distances between the base stations are not too great, the synchronization means that the channel measurement sequences based on cyclic correlation are orthogonal. All the base stations can thus transmit the channel measurement sequences continuously and at a constant power level. The data blocks D1, D2 themselves can be transmitted at a different power level, or may be omitted completely, as is illustrated in Figure 2, when the power level P of the data blocks D1, D2 and the Midamble MA for various power levels of the data blocks D1, D2 are plotted in the vertical direction. The power level of the channel measurement sequence in the Midamble MA is always constant. This applies, for example, to timeslots in which the respective base station is not connected to any radio station at that time. With the synchronization of the timeslots and various code phases, the channel measurements by the mobile stations provide measured values for the transmission characteristics and attenuation levels relating to the various base stations, without data transmission interfering with these measurements.

With the above numerical example, adjacent base stations use a code phase stagger of 25 µs. In the above example, the code phase is repeated after 7 base stations. This thus results in a "re-use cluster" of 7 for re-use of the same code phases for channel measurement by the mobile stations, as is illustrated in Figure 3. With the above numerical example, a mobile

station can measure the transmission characteristics of up to 7 base stations by evaluation of the received channel measurement sequences in a single timeslot, as is shown by the schematically illustrated measurement window in Figure 4. In principal, "re-use clusters" other than 7 can also be used, for example 3,4,6,7,9 etc. The larger the chosen "re-use cluster" size, the less is the possible interference from other base stations with the same code phase from beyond normal ranges.

A further advantage, in addition to rapid measurement of the base stations, is that one radio station can be handed over quickly from one base station to another base station, provided the timeslots are synchronized. A radio station can measure a greater number of adjacent base stations at the same time in one timeslot (in the above example up to six adjacent base stations) by evaluation of the channel measurement in a single timeslot ZS. A radio station can thus be handed over from one base station to another base station from one time frame to the next, subject to the fixed base stations and the fixed network having appropriate capabilities. Interruption-free handover to another base station is thus feasible. The method allows very high rates of reaction to changes in the radio environment, for example resulting from the speeds of the radio stations (single look MAHO).

Continuous transmission of the channel measurement sequences in the proposed radio system allows the radio stations to measure the transmission characteristics relating to various base stations in the (passive) reception mode during each Midamble and, furthermore, allows the differences in the distances to the various base stations to be determined from the delay time differences. This allows passive operation

for finding the positions of the mobile stations without the radio stations themselves having to transmit signals, and thus without loading the transmission capacity of the radio system. In principle, the differences between the distances to three base stations are sufficient for position finding. The possibility of simultaneous measurement of up to 7 base stations in the example quoted here in general allows an increase in the measurement accuracy owing to the redundancy of the measured values obtained from the distance differences. In Figure 4, for example, the differences in the distances to up to seven base stations would be possible for the middle cluster in Figure 3. Channel measurement sequences received from more than normal ranges have no adverse effect on the measurement accuracy of the position finding process, since such signals occur later in time than the front edges of the channel impulse responses of the base stations which are to be measured and which are significant for distance difference measurement. The accuracy of the position finding process is dependent on the synchronization accuracy of the base stations and resolution of the channel measurement, and thus on the bandwidth of the radio system. The information required for position finding, such as the position of the base stations and of the adjacent base stations, can be transmitted cyclically via a broadcast channel. Since position finding requires only the evaluation of received signals, any desired number of radio stations can determine their present position. This characteristic is important, for example, for telematics applications.

In one preferred development, the timeslot 0 in the time frame is identified in a particular manner. However, it is preferable to use the same channel measurement sequence as in the other timeslots. The channel measurement sequences can thus be phase-modulated in the timeslot 0. In the simplest case, phase modulation of 180° can be used from one time

frame to the next. Thus, if the mobile station is stationary, this results in this timeslot producing a result

whose mathematical sign alternates, and this makes it simple to distinguish this from the results from the other timeslots. If the radio stations are moving, shifts arise from the Doppler effect that occurs, but the timeslot 0 can be identified uniquely from the other timeslots.

The explained method is not limited to TDD radio systems, but can also be used in FDD systems in which timeslots are likewise used. Furthermore, the system according to the invention can be operated with different frequency repetition factors (frequency re-use clusters). Preferred embodiments are frequency re-use clusters of 1, 3 and 4.

Patent Claims

1. A method for measurement of the transmission characteristics of the radio channels in a radio communications system having a number of base stations (BS) and at least one further radio station (MS), with the radio communications system having a timeslot structure in a time frame,
in which one of the base stations transmits data (D1, D2) in the form of bursts to one of the other radio stations, with each burst also having a specific channel measurement sequence (MA),
characterized
in that the base station transmits the specific channel measurement sequence (MA) even in at least one timeslot (ZS) in which no data are transmitted from the base station to one of the other radio stations.

2. The method as claimed in claim 1,
characterized
in that the channel measurement sequence is transmitted at a constant power level and/or by number of base stations (BS) at the same time.

3. The method as claimed in one of the preceding claims,
characterized
in that the channel measurement sequence is transmitted in the middle of a burst (B).

4. The method as claimed in one of the preceding claims,
characterized
in that the base stations (1,...,7) are synchronized.

5. The method as claimed in claim 4,
characterized
in that cyclic correlation is used for channel measurement.

6. The method as claimed in claim 5,

characterized
in that the individual base stations (1,...,7) use the same channel measurement sequence.

7. The method as claimed in claim 6,
characterized
in that the channel measurement sequence is transmitted with a different code phase by the various base stations (1,...,7).

8. The method as claimed in one of the preceding claims,
characterized
in that the channel measurement sequence in a predetermined timeslot (ZS) in the time frame has a special identifier.

9. The method as claimed in claim 8,
characterized
in that the same channel measurement sequence as that in the other time slots (ZS) is used, with phase modulation being used in the channel measurement sequence in the predetermined timeslot (ZS).

10. The method as claimed in claim 9,
characterized
in that 180° phase modulation of the channel measurement sequence in the predetermined timeslot (ZS) is used from one time frame to the next.

11. The method as claimed in one of claims 8-10,
characterized
in that the predetermined timeslot (ZS) is the 0-th timeslot.

12. A radio communications system having a number of base stations (BS) and at least one radio station (MS) using the method as claimed in one of claims 1 to 11.

13. The apparatus as claimed in claim 12, with said apparatus being a TDD radio communication system.

14. The apparatus as claimed in claim 12, with said apparatus being a FDD radio communication system.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: *(Name und Registrationsnummer anführen)*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

And I hereby appoint

Customer No. 26161

Telefongespräche bitte richten an: *(Name und Telefonnummer)*

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Voller Name des einzigen oder ursprünglichen Erfinders:	Full name of sole or first inventor:
GERHARD RITTER	GERHARD RITTER
~~Unterschrift des Erfinders~~ Datum	Inventor's signature Date
Gerhard Ritter 20/11/2001	
Wohnsitz	Residence
THAINING, DEUTSCHLAND	THAINING, GERMANY
Staatsangehörigkeit	Citizenship
DE	DE
Postanschrift	Post Office Addess
MUEHLWEG 1	MUEHLWEG 1
86943 THAINING	86943 THAINING
Voller Name des zweiten Miterfinders (falls zutreffend):	Full name of second joint inventor, if any:
Unterschrift des Erfinders Datum	Second Inventor's signature Date
Wohnsitz	Residence
Staatsangehörigkeit	Citizenship
Postanschrift	Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren zum Betreiben eines Funk-Kommunikationssystems und derartiges Funk-Kommunikationssystem

deren Beschreibung

(zutreffendes ankreuzen)
☐ hier beigefügt ist.
☒ am 03.09.1999 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE99/02804
eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method for operating a radio communication system and corresponding radio communication system

the specification of which

(check one)
☐ is attached hereto.
☒ was filed on 03.09.1999 as
PCT international application
PCT Application No. PCT/DE99/02804
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed	
19840507.3	DE	04.09.1998	☒	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein
			☐	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein
			☐	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE99/02804	03.09.1999		
(Application Serial No.) (Anmeldeseriennummer)	(Filing Date D, M, Y) (Anmeldedatum T, M, J)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)
(Application Serial No.) (Anmeldeseriennummer)	(Filing Date D,M,Y) (Anmeldedatum T, M; J)	(Status) (patentiert, anhängig, aufgeben)	(Status) (patented, pending, abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.